

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

A Holder for Electric or Electronic Components

We, NORTHROP CORPORATION, a corporation organized under the laws of the State of California, United States of America, of 9744 Wilshire Boulevard, P.O. Box 1525 Beverly Hills, Los Angeles County, State of California, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a holder or clip for an electric or electronic component.

With the relatively recent development of transistors along with the marked reduction in size of electric or electronic components an increasingly apparent problem was created. There was no reliable method or device for holding the components in their respective environments. For instance, transistors were incorporated into printed circuits, and these circuits, in the nature of "units" were subjected to and were required to pass certain rigid tests. The test constituted, in some instances, severe vibrations or shocks. The absence of proper holding means resulted in the transistors being separated from the units. In short, they broke loose. Adding to the problem of adequately holding a transistor was the fact that the exterior surface of the transistor casing may be tapered. The angle of the taper may not be large but it was an added complication to the solution of the problem.

Additionally, electrical and electronic components, become heated in operation, and are subjected also to heating from other components. As a result optimum and efficient operation of the components is decreased or greatly impaired.

An object of this invention is to provide a clip for an electric or electronic component that will hold the component reliably in its

proper location and environment regardless of normal abuse to which it may be subjected.

The invention comprises a clip for holding an electric or electronic component having a circumferential flange comprising: a U-shaped casing having a plate and legs; a tab on the plate of said casing that extends in a direction opposed to the legs of said casing; and a second tab on the plate that extends in the same direction as the legs and is spaced therefrom so that the circumferential flange on the component to be held will fit between said second tab and said legs.

In the accompanying drawings, which represent an embodiment of the invention:—

Figure 1 is a fragmentary perspective view illustrating and having embodied therein the improved clip of the present invention as it may be used in a printed circuit unit;

Figure 2 is a fragmentary perspective view of the clip, without the transistor, and showing that end opposed to the view of Figure 1;

Figure 3 is a plan elevation view illustrating the clip and the position assumed by the resilient legs when the transistor is held therein;

Figure 4 is a side elevation view of the clip illustrating the relationship of the tabs with respect to the transistor and printed circuit unit;

Figure 5 is an end elevation view showing a clip that is narrower than that illustrated in Figures 1 to 4, in order that a transistor may be placed in the clip in a slightly different manner; in all other respects the clip is identical to that shown in the other figures.

Referring to the drawings for a more detailed description of the present invention, 10 designates a printed circuit unit which in the present instance comprises a board 12 and a rail 14. Most of the printed circuit com-

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ponents and related structure are located on the board.

The clip, broadly designated 16, is a U-shaped body having a plate 18. The plate has an opening therethrough through which a fastener in the form of a rivet 20 extends for the purpose of attaching the clip to the unit 10, in the manner illustrated.

The board 12 and the rail 14 have an opening 22 therein into which extends a tab 26. The tab 26 is in combination with the rivet 20 prevents the clip 16 from rotating.

Another stop tab 28 extending in a direction opposed to that of tab 26 contacts the transistor 30 when one is present and is in a position to prevent inadvertent removal of the transistor from the clip as a result of external conditions such as imposed vibrations.

The legs 32 of the clip extend perpendicular to the plate 18 and are spaced from tabs 28 and 26. The legs are bifurcated to provide four resilient leg parts 34. Each leg part with reference to the plate, bend outwardly then inwardly to provide a concavo-convexo area 36 which receives the transistor 30. Then the leg parts bend outwardly on the free ends 38 to provide an entrance area for the transistor.

The operation and mounting of the clip 16 is as follows: The tab 26 is properly located in the openings 22 and the clip is fastened by the rivet 20. The transistor having a tapered casing 39 is pressed or snapped into place, as illustrated, with the annular flange 40 of the casing between tab 26 and tab 28. The flange 40 extends beyond the leg part 34 and is between the latter and the tab 28 in the manner illustrated in Figures 1, 3, 4 and 5. This is done to prevent the transistor from moving outwardly of the clip 16. As illustrated, the transistor cannot move out of the clip in the direction opposed to the tab 28 because the flange 40 is between the tab 28 and the leg part 34. The transistor 30 may only be inserted or removed from the clip 16 by lifting up or pressing the same down between the legs 34. Due to the fact that the casing is tapered two opposed leg parts 34 extend inwardly toward the centre of the clip a greater distance than the other two. As a result there is a four point contact on the transistor which provides a greater holding area than if there were only two non-bifurcated legs 34. The transistor 30, by virtue of this provision, is most firmly held and resists the forces of vibration to a greater degree.

It is to be noted that the transistor 30 does not touch or contact the plate 18. Such vibration and shock as is imposed on the

transistor is taken or absorbed by the resilient leg part 34. As a result, a severe impact is not imposed on the transistor. Each leg part will move in the same direction as each other leg part and in the same amount when vibrations are present. Therefore, the transistor is always firmly held and random vibrations that may originate or stem from the plate 18, or other source, are not imposed in their full force on the leg part 34 or the transistor 30. Further, the delicate electrical leads 42 extending out of the transistor 30 are adequately protected against severing or breaking. Additionally, the space between the areas 36 and the plate 18 provides space through which air may circulate to cool the transistor 30.

WHAT WE CLAIM IS:—

1. A clip for holding an electric or electronic component having a circumferential flange comprising: a U-shaped casing having a plate and legs; a tab on the plate of said casing that extends in a direction opposed to the legs of said casing; and a second tab on the plate that extends in the same direction as the legs and is spaced therefrom so that the circumferential flange on the component to be held will fit between said second tab and said legs.

2. The clip according to Claim 1, wherein said tabs are in a substantially parallel relationship; the plate of said casing having a fastener receiving opening therein that is located between said tabs.

3. The clip according to Claim 1 or 2, wherein said legs are bifurcated to provide a four-point contact on the component.

4. A clip for holding an electric or electronic component having a tapered casing and an integral annular flange comprising a plate; legs on and integral with said plate; said legs being bent outwardly, inwardly and outwardly with reference to said plate; said legs being resilient and partially bifurcated to provide a four point contact on the tapered casing of said component to be held; a tab on said plate that extends in a direction opposed to said legs; and a second tab on said plate that is spaced from and extends in the same direction as said legs and in combination with said legs prevents movement of said component when held by the clip, said flange of said component being between said second tab and said legs.

5. A clip constructed as herein described with particular reference to the embodiment illustrated in the accompanying drawings.

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1 SHEET

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